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(54) **CHEESE-LIKE FOOD**

(57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain both a new cheese-like food having an inhibitory function for fat accumulation, a reduction promoting function for accumulated fat and an ameliorating function for carbohydrate metabolism abnormality, expectable to have preventing and ameliorating effects on life-style related diseases accompanying obesity and a food using the cheese-like food.

**SOLUTION:** This cheese-like food contains a glyceride composed of a conjugated highly unsaturated fatty acid having a conjugated triene structure. The food is obtained by using the cheese-like food. The conjugated highly unsaturated fatty acid glyceride comprises at least one kind selected from the group consisting of punicic acid, eleostearic acid, jarcalic acid, calendic acid and catalpic acid. Oils and fats containing these acids are selected

from the group consisting of a pomegranate seed oil, a seed oil of Momordica Charantia, a calendula seed oil, a trumpet creeper seed oil, a catalpa seed oil, a balsam apple seed oil, a snake gourd seed oil, a pumpkin seed oil, a tung seed oil and a cherry seed oil.

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## CLAIMS

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[Claim(s)]

[Claim 1] Cheese-head Mr. food which comes to contain the conjugation higher unsaturated fatty acid glyceride which has conjugation trien structure (-CH=CH-CH=CH-CH=CH-).

[Claim 2] Cheese-head Mr. food according to claim 1 whose cheese-head Mr. food is a cheese food, a cheese-head processed food, or an imitation cheese head.

[Claim 3] Cheese-head Mr. food according to claim 1 or 2 which is at least one sort chosen from the group which a conjugation higher unsaturated fatty acid becomes from a

punicic acid, alpha-eleostearic acid, beta-eleostearic acid, jarcaric acid, a KARENDEIN acid, and catarrh pinic acid.

[Claim 4] Cheese-head Mr. food given in any of claims 1-3 which come to contain the fats and oils containing a conjugation higher unsaturated fatty acid glyceride they are.

[Claim 5] Cheese-head Mr. food according to claim 4 which is fats and oils extracted from at least one sort of vegetable seeds chosen from the group which the fats and oils containing a conjugation higher unsaturated fatty acid glyceride become from the department of a pomegranate, \*\* which it hears, Euphorbiaceae, and the vegetation which gets and belongs to \*\*, Bignoniaceae, and Rosaceae.

[Claim 6] Cheese-head Mr. food according to claim 5 which is at least one sort of vegetable seed oil chosen from the group which the extract of a vegetable seed becomes from pomegranate seed oil, bitter cucumber seedoil, common marigold seed oil, trumpet-creeper seed oil, Japanese catalpa seed oil, U.S. Japanese catalpa seed oil, balsam Apple Computer seed oil, the Snake guard seed oil, Japanese pumpkin seed oil, the Aleurites seed oil, and cherry seed oil.

[Claim 7] Cheese-head Mr. food given in any of claims 1-6 whose contents of a conjugation higher unsaturated fatty acid glyceride are 1% of the weight or more of food AUW, and less than 51 % of the weight they are.

[Claim 8] Cheese-head Mr. food given in any of claims 1-7 which have at least one function in an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function they are.

[Claim 9] Food which comes to use cheese-head Mr. food given in any of claims 1-8 they are.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention has an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function, and relates to the food using the cheese-head Mr. food and it which can expect prevention and the improvement effect of the lifestyle-related disease accompanying obesity.

[0002]

[Description of the Prior Art] Cheese-head Mr. food is food which presents flavor and mouthfeel peculiar to a cheese head, and has some which do not use not only a thing but the cheese head using the cheese head as a main raw material. Cheese-head Mr. food by it is not only using as food, but using together with other food materials by preference from having peculiar flavor and peculiar mouthfeel in itself Since it has the function which raises the delicacy of other foods, the place where the eating habits of our country follow on Western-style-izing at, and are greatly used comes, and it has become one of the food which must be set to the domestic table and the food industry of our country by the end of today. However, since much of cheese-head Mr. food contains a lot of fat which contributes to the peculiar flavor and peculiar mouthfeel, it is high energy, and it poses a problem that it is the food which causes obesity easily by superfluous intake. Obesity, especially obesity of a visceral fat mold are important factors which cause many lifestyle-related diseases, and avoiding superfluous intake of the food which causes obesity is recommended.

[0003] Based on such a situation, development of a low fat, a non-fat, or the cheese-head Mr. food of low energy is furthered. The water retention which adds the *Lactobacillus helveticus* (*Lactobacillus helveticus*) which has the property which produces a polysaccharide as an example of a low fat cheese, and is acquired is good. For example, hard natural cheese with a low fat content (JP,11-155481,A), the salts of the cation of the monovalence permitted by low fat raw material milk on food sanitation hygiene -- 0.1 - 3% (% of the weight --) Below The same low fat natural cheese which added and used this as a raw material (JP,9-262053,A), It is characterized by carrying out heating fusion of the raw material containing fused salt and an O/W mold emulsifier. The low fat process cheese (JP,9-154485,A) whose fat content is 22% or less and whose fat / protein weight ratio are 1.0 or less The fat extracted from the cheese head is blended with a skim milk 0.5 to 2.0%. After emulsification, the low fat cheese (JP,8-289728,A) which carries out card making and consists of riping -- moreover, as an example of a non-fat cheese head Pectin, a pectic-acid salt, alginate, an agar, konnyaku, gellan gum, The cream cheese which replaces with and uses for all or a part of fat and/or oil the imitation fat constituent chosen from the group which consists of kappa carrageenin, curdlan, and those mixture (JP,5-3767,A), Non fat powder milk, xanthan gum, and the non fat cream cheese (JP,5-192079,A) that uses a carrageenan are mentioned. Materials other than a fat are substituted for these fats, or although the cheese head and cheese-head Mr. food which were manufactured using the material with few fat contents are low energy as compared with the thing containing many original fat, they are said for there to be few tastes of a fat. First of all, flavor and mouthfeel peculiar to cheese-head Mr. food are dependent on the cobwebbing phenomenon by the fat of a high content, and high-concentration protein, fat is an important component, and reduction of fat cannot say it as a desirable thing in respect of the flavor of cheese-head Mr. food. Moreover, the

adiposity depressor effect and the depot fat reduction facilitatory effect of the low fat developed until now or a non-fat cheese head, and cheese-head Mr. food are not checked. [0004]

[Problem(s) to be Solved by the Invention] In view of the above-mentioned present condition, the purpose of this invention has an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function, and is to offer the food using the new cheese-head Mr. food and new it which can expect prevention and the improvement effect of the lifestyle-related disease accompanying obesity.

[0005]

[Means for Solving the Problem] The fatty acid which has conjugation trien structure was the agonist of the peroxisome activator responsibility acceptor (PPAR:peroxisome proliferator-activated receptor) which is the important controlling factor of the fat metabolism, and when this invention persons did the food intake of the triglyceride derivative to the mouse, they already found out and did patent application of demonstrating a remarkable adiposity control function and a depot fat reduction promotion function (JP,2000-355538,A). Then, as a result of repeating examination that the conjugation higher unsaturated fatty acid glyceride which has the above-mentioned conjugation trien structure should be applied to concrete food, the food using the cheese-head Mr. food and it containing the glyceride concerned came to complete this invention for flavor and mouthfeel demonstrating a satisfactory remarkable adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement effect, as a result of repeating examination further, a header and.

[0006] That is, the 1st of this invention is related with the cheese-head Mr. food which comes to contain the conjugation higher unsaturated fatty acid glyceride which has conjugation trien structure ( $-\text{CH}=\text{CH}-\text{CH}=\text{CH}-\text{CH}=\text{CH}-$ ). The cheese-head Mr. food of the above-mentioned publication whose (1) cheese-head Mr. food is a cheese food, a cheese-head processed food, or an imitation cheese head as a desirable embodiment, (2) A conjugation higher unsaturated fatty acid A punicic acid, alpha-eleostearic acid, The cheese-head Mr. food of the above-mentioned publication which is at least one sort chosen from the group which consists of beta-eleostearic acid, jarcenic acid, a KARENDEIN acid, and catarrh pinic acid, (3) the fats and oils containing the cheese-head Mr. food (4) conjugation higher unsaturated fatty acid glyceride of the above-mentioned publication containing the fats and oils containing a conjugation higher unsaturated fatty acid glyceride The department of a pomegranate, \*\* which it hears, Euphorbiaceae, the cheese-head Mr. food of the above-mentioned publication which is fats and oils extracted from at least one sort of vegetable seeds chosen from the group which consists of vegetation which gets and belongs to \*\*, Bignoniaceae, and Rosaceae, (5) The extract of a vegetable seed Pomegranate seed oil, bitter cucumber seed oil, common marigold seed oil, Trumpet-creeper seed oil, Japanese catalpa seed oil, U.S. Japanese catalpa seed oil, Balsam Apple Computer seed oil, the Snake guard seed oil, Japanese pumpkin seed oil, The cheese-head Mr. food of the above-mentioned publication which are at least one sort of vegetable seed oil chosen from the group which consists of Aleurites seed oil and cherry seed oil, (6) The content of a conjugation higher unsaturated fatty acid glyceride 1% or more of food AUW the cheese-head Mr. food of

the above-mentioned publication which has at least one function in the cheese-head Mr. food of the above-mentioned publication which is less than 51%, (7) adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function -- it comes out.

[0007] The 2nd of this invention is related with the food which comes to contain the cheese-head Mr. food of the above-mentioned publication.

[0008] Although the conjugation higher unsaturated fatty acid glyceride which has the above-mentioned conjugation trien structure of using for this invention is well-known fats and oils, naturally existence is known by only the specific vegetable seed and the example of the cheese-head Mr. food which is fats and oils more underdeveloped than there are also few contents as edible oil and fat, and contains these fats and oils is not known.

[0009]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail. Cheese-head Mr. food of this invention is characterized by containing the conjugation higher unsaturated fatty acid glyceride (henceforth a "conjugation trien higher unsaturated fatty acid glyceride") which has conjugation trien structure as a fats-and-oils component. the cheese-head Mr. food of this invention is food which presents flavor and mouthfeel peculiar to a cheese head, and use a cheese head as a main raw material -- what does not use a cheese head -- be -- it is included. As an example of the cheese-head Mr. food of this invention, a cheese food, a cheese-head processed food, and imitation cheese heads are mentioned. Said cheese food is food which contains cheese heads, such as one sort or two sorts or more of natural cheese, or process cheese, 51% or more in a product, adds additives, such as fats and oils, if needed, is ground and mixed and presents the cheese-head flavor manufactured by carrying out heating fusion. Moreover, said cheese-head processed foods are cheese heads in which, as for less than 51% of cheese heads and an imitation cheese head, a cheese-head content does not contain a part for a cheese head.

[0010] When manufacturing the cheese food and cheese-head processed food of this invention, it may not be limited to the class of cheese head to be used, and a process, and natural cheese, process cheese, an elasticity cheese head, a half-rigid cheese head, a hard cheese head, or the nature cheese head of superhard is sufficient, and although a non-ripping type, a bacteria aging type, a \*\*\*\* type, a lactic-acid-fermentation type, a propionic fermentation type, etc. are mentioned, especially limitation does not have the class of a place of production and raw material milk further, either. Moisture contents, such as KATEJI of 50% of moisture, a cream, KUWARUKU, mozzarella, a phosphorus bull gar, hunt, camembert, and Brie, are mentioned for GODA of 25 - 40% of moisture contents, such as 40 - 50% of chill JITTO, Munster, a brick, a lock hole, blue, Gorgonzola, and a still ton, Cheddar, pro boron, Edam, Emmental, gruyere etc., specifically a moisture content be mentioned for 20% or less of Parmesan, Romano, SAPUSAGO If the convenience at the time of mixing and melting in manufacture of a cheese food or a cheese-head processed food is taken into consideration, it is desirable to use the cheese head of 40% or more of moisture contents. The cheese food and cheese-head processed food of this invention According to the purpose, one sort or two sorts or more are chosen from the above-mentioned cheese head as arbitration. The constituent suitably chosen from the fats and oils which mix and grind and contain a conjugation trien higher unsaturated fatty acid glyceride or this as a fats-and-oils component, and the

constituent usually used for manufacture of a cheese food or a cheese-head processed food, For example, protein, sodium polyphosphate, sodium metaphosphate, Fused salt, such as phosphate and citrate, potato starch, a tapioca starch, amyllum tritici, Natural starch or its workpieces, such as corn starch, waxy cornstarch, a sago starch, and amyllum oryzae, Emulsifiers, such as lecithin, a glycerine fatty acid ester, a sorbitan fatty acid ester, propylene glycol fatty acid ester, and sucrose fatty acid ester, and water may be added, heating fusion may be carried out, and you may emulsify. Components other than a conjugation trien higher unsaturated fatty acid glyceride can be chosen from what is used for manufacture of the usual cheese-head Mr. food.

[0011] The imitation cheese head of this invention may be the food which secured the cheese head's flavor and mouthfeel using food materials other than a cheese head, and may be a thing a process cheese type, a cream cheese type, a MOTSUARERA cheese-head type, or another type. Except using the fats and oils containing a conjugation trien higher unsaturated fatty acid glyceride or this, the presentation of a common imitation cheese head is sufficient as the imitation cheese head of this invention, for example, it can choose and use various casein, such as various caseinate, such as sodium caseinate and calcium caseinate, acid casein, and rennet casein, soybean protein, etc. for arbitration as a proteinic source of supply. As other constituents, moreover, water and fused salt (modified starch is included), for example, starch, Gelatin, an agar, pectin, locust bean gum, xanthan gum, Guar gum, gum arabic, a carboxymethyl cellulose (CMC), Tragacanth gum, tamarind gum, a furcellaran, ovalbumin, Odor-masking agents, such as stabilizers, such as a whey protein, an emulsifier, and a cheese-head flavor For example, a lactic acid, a citric acid, an adipic acid, a phosphoric acid, a tartaric acid, a succinic acid, It can obtain by being able to use acids, such as organic acids, such as a phthalic acid, a malic acid, phytic acid, and a gluconic acid, an inorganic acid, and a lactic-acid-bacteria fermentation object, etc., adding these suitably, and homogenizing with emulsifiers, such as a homogenizer, an in-line mixer, and a colloid mill, after heating melting.

[0012] The conjugation trien higher unsaturated fatty acid glyceride used for the cheese-head Mr. food of this invention If it is the glyceride which contains in a molecule the fatty acid which has conjugation trien structure as a configuration fatty acid, there will be especially no limitation. Although it can be chosen as arbitration from the glyceride which contains the fatty acid of 3-6, and carbon numbers 10-22 in a molecule whenever [ partial saturation / which has conjugation trien structure ] (the number of carbon-carbon unsaturated bonds) The glyceride of the fatty acid of the vegetable seed oil origin of a carbon number 18 is more desirable than the ease of acquisition etc. as a concrete example a punicic acid (punicic acid) (18:3 and 9c -- 11t) 13c and a KARENDEIN acid (calendic acid) (18: -- 3 or 8t) 10t, 12c, and jarcacic acid (jarcalic acid) (18:3 and 8c --) 10t, 12c, and alpha-eleostearic acid (alpha-eleosteallicacid) (18:3 and 9c --) 11t, 13t, and beta-eleostearic acid (beta-eleosteallic acid) (18: -- 3 or 9t) 11t, 13t, and catarrh pinic acid (catalpic acid) (18: -- 3 or 9t) The glyceride of 11t, 13c, a KAMURO renin acid (kamlolenic acid) (18OH, 9c, 11t, 13t), other conjugation octadecatrienoic acids, and eicosa tetraenoic acid etc. is mentioned. Also among these glycerides, the glyceride of a punicic acid and alpha-eleostearic acid is the most desirable than the field of stability, economical efficiency, and efficacy strength. Although which form of a monoglyceride, diglyceride, and a triglyceride is sufficient as the conjugation trien higher unsaturated fatty acid glyceride of this invention, its form of a triglyceride is more desirable than the

physical properties as edible oil and fat, and the field of flavor. In these diglycerides and a triglyceride, it is not restricted especially that what is necessary is just to choose the location and number with which a conjugation trien higher unsaturated fatty acid is esterified according to the purpose. For example, in diglyceride, it may be esterified by one place of the arbitration of the 1st place, the 2nd place, and the 3rd place, or two places, and may be esterified by 1-3 places of the arbitration of the 1st place, the 2nd place, and the 3rd place in a triglyceride. As a concrete conjugation trien higher unsaturated fatty acid glyceride 1-punicyl-sn-glycerol (1-punicyl-sn-glycerol), 2-punicyl-sn-glycerol (2-punicyl-sn-glycerol), 1, 2-dipunicyl-sn-glycerol (1, 2-dipunicyl-sn-glycerol), 1, 3-dipunicyl-sn-glycerol (1, 3-dipunicyl-sn-glycerol), 1, 2, 3-TORIPUNI seal-sn-glycerol (1, 2, 3-tripunicyl-sn-glycerol), 1-alpha-ERO steer reel-sn-glycerol (1-alpha-ereostearyl-sn-glycerol), 2-alpha-ERO steer reel-sn-glycerol (2-alpha-ereostearyl-sn-glycerol), 1, 2-JI alpha-ERO steer reel-sn-glycerol (1, 2-di alpha-ereostearyl-sn-glycerol), 1, 3-JI alpha-ERO steer reel-sn-glycerol (1, 3-di alpha-ereostearyl -sn-glycerol), 1, 2, and 3-Tori alpha-ERO steer reel-sn-glycerol (1, 2, 3-tri alpha-ereostearyl-sn-glycerol) etc. is mentioned.

[0013] the conjugation trien higher unsaturated fatty acid glyceride of this invention should be manufactured by the resultant using the chemical approach or an enzyme -- be extracted from natural animals and plants -- although all can be used, considering the taste of the application as edible oil and fat, or the consumer of these days, natural vegetable oil and fat, animal fat and oil, and marine-products fats and oils are desirable, and vegetable seed oil is still more desirable than the field of quantitative reservation. these animal-and-vegetable-oils fat -- natural animals and plants -- a vegetable seed can be preferably extracted and obtained by the general approach. As an example of the desirable vegetable seed containing the conjugation trien higher unsaturated fatty acid glyceride of this invention, the seed of the department (Punicaceae) of a pomegranate, \*\* (Compositae (Asteraceae)) which it hears, Euphorbiaceae (Euphordiaceae), and the vegetation which gets and belongs to \*\* (Cucuritaceae), Bignoniaceae (Bignoniaceae), and Rosaceae (Rosaceae) is mentioned. Also among these, the seed of the department of a pomegranate with easy quantitative acquisition, Rosaceae, and the vegetation that gets and belongs to \*\* is more desirable. As a concrete example of desirable vegetable seed oil, pomegranate seed oil, bitter cucumber seedoil, Common marigold seed oil, trumpet-creeper seed oil, Japanese catalpa seed oil, U.S. Japanese catalpa seed oil, Balsam Apple Computer seed oil, the Snake guard seed oil, Japanese pumpkin seed oil, The Aleurites seed oil, cherry seed oil, etc. are mentioned. Also among these Pomegranate seed oil, bitter cucumber seedoil, balsam Apple Computer seed oil, the Snake guard seed oil, and the Aleurites seed oil are more desirable than the content of the conjugation trien higher unsaturated fatty acid glyceride in the inside of a seed, and pomegranate seed oil and bitter cucumber seedoil are the most desirable than the ease of acquisition. The conjugation trien higher unsaturated fatty acid glyceride of this invention will receive a limit neither according to whenever [ purification ], nor especially quality, if an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function are demonstrated. For example, the fats and oils which could refine the conjugation trien higher unsaturated fatty acid glyceride to the high grade by adsorption chromatography, a partition chromatography, ion exchange chromatography, molecular sieve chromatography, the fractional extraction by



the organic solvent, fractional crystallization, molecular distillation, etc., and could use it from the raw material of the natural origin, and were obtained by the solvent extraction method or the milling process from the vegetable seed may be used as it is.

[0014] A free fatty acid content is 0.3% or less, it is desirable that flavor is good, and, so, it is usually more desirable than it is the food with which cheese-head Mr. food values flavor although there is especially no limit in the quality of the conjugation trien higher unsaturated fatty acid glyceride and other edible oil and fat which are used for the cheese-head Mr. food of this invention to use the fats and oils which refined [ rather than ] a winter rise, decolorization, deodorization, etc. using a plant extract as it is. Although the content of the conjugation trien higher unsaturated fatty acid glyceride in the cheese-head Mr. food of this invention is suitably chosen as the application of cheese-head Mr. food and the fats and oils used, and a list by other classes and quantitative ratios of an additive, in the case of a cheese food, 1% or more and less than 10% of addition is desirable. At less than 1%, exertion of an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function is difficult, and it separates from the addition exceeding 10% from the specification of a cheese food. When the cheese-head Mr. food of this invention is a cheese-head processed food or an imitation cheese head, 1% or more and less than 51% of the content of a conjugation trien higher unsaturated fatty acid glyceride is desirable, and is usually more more desirable than the field of taste. [ 10 - 35% of ] At less than 1%, the adiposity control function of the cheese-head Mr. food of this invention, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function are weak, and it has a bad influence on the physical properties as cheese-head Mr. food at 51% or more.

[0015] the edible oil and fat used for the cheese-head Mr. food of this invention -- a conjugation trien higher unsaturated fatty acid glyceride -- a conjugation trien higher unsaturated fatty acid glyceride and other edible oil and fat may be mixed suitably independently. Furthermore, the fats and oils which carried out the random ester interchange of the fats and oils which mixed a conjugation trien higher unsaturated fatty acid glyceride and other edible oil and fat by the general approach are sufficient. If used in cheese-head Mr. food manufacturing as other edible oil and fat, especially a limit cannot be received, for example, it can choose from fats and oils, such as cotton seed oil, soybean oil, corn germ oil, rapeseed oil, safflower oil, and rice bran oil.

[0016] With the cheese-head Mr. food of this invention, the food materials and food additives other than fats and oils can be added for the purpose. For example, egg components, such as acidulants, such as vinegar, citruses fruit juice, and a citric acid, the yolk, an albumen, and a desiccation egg, Saccharides, such as protein hydrolyzates, such as gelatin, sugar, BUTOU sugar, fruit sugar, and a starch syrup, Seasonings, such as salt, sodium L-glutamate monohydrate, and 5'-INSHIN acid disodium, mustard -- carry out -- thickening agents, such as emulsifiers, such as spices, such as \*\*\*\*\*, and lecithin, a seasoning agent, perfume, a carrageenan, xanthan gum, and pectin, a tomato workpiece, red cabbage colour, a paprika pigment, a caramel, and a gardenia -- coloring agents, such as coloring matter, formation-of-a-paste starch, etc. may be added suitably. Moreover, with the cheese-head Mr. food of this invention, from a conjugation trien higher unsaturated fatty acid glyceride being included, in order to prepare for oxidation degradation, an anti-oxidant may be added. As an anti-oxidant, citrate, such as plant pigment, such as flavones, such as polyphenol, such as vitamin A precursors, such as

ascorbic-acid derivatives, such as phospholipid, such as lecithin and phosphatidylethanolamine, tocopherols, an ascorbic acid, and ascorbyl palmitate, and carotene, and a catechin, and rutin, isoflavone, plant extracts like a rosemary extract, and lycopene, and isopropyl citrate, is mentioned, for example. Although the addition of an anti-oxidant is suitably chosen by the presentation of the anti-oxidant chosen and the fats and oils used, in the case of a tocopherol, 0.4mg - its 100 mg/kg are desirable, and 1mg - its 40 mg/kg are more desirable, for example. Less than 0.4 mg/kg of the antioxidation effectiveness is insufficient, and the effectiveness of the addition exceeding 100 mg/kg changes and is not economical.

[0017] Manufacture of the cheese-head Mr. food of this invention can be manufactured according to the manufacturing method of common cheese-head Mr. food except using the glyceride which consists of a conjugation trien higher unsaturated fatty acid. In that case, it is independent, or it may blend with other common edible oil and fat, may add, and the fats and oils which contain a conjugation trien higher unsaturated fatty acid glyceride or this at the stage to add fats and oils by the usual manufacturing method may be carried out. for example, -- while supplying the specified quantity of natural cheese or process cheese, the edible oil and fat containing a conjugation trien higher unsaturated fatty acid glyceride, salt, fused salt, and water to containers, such as the Stephen cooker, and supplying a steam -- warming -- after carrying out kneading, the cheese food containing a conjugation trien higher unsaturated fatty acid glyceride can be obtained by cooling. Moreover, for example, in the case of a cheese-head processed food, supplying the specified quantity of less than 51% of natural cheese or process cheese, fused salt, such as vegetable seed oil containing a conjugation trien higher unsaturated fatty acid glyceride, salt, and sodium polyphosphate, and water to iron pots, such as the Stephen cooker, and stirring it to food AUW, open steam is supplied, and warming, melting, and after carrying out kneading, it can obtain by putting into a container and cooling. moreover, the case of an imitation cheese head -- an iron pot -- water, fused salt, and salt -- warming -- after the dissolution Cleaning proteins, such as rennet casein and skim milk powder, amyllum oryzae, corn starch, After adding thickeners, such as gum arabic and a carrageenan, carrying out heating stirring, adding an acid taste agent etc. and water further and carrying out heating stirring, The vegetable seed oil containing a conjugation trien higher unsaturated fatty acid glyceride can be added, the cheese-head flavor which carried out heating stirring further, a coloring agent, an anti-oxidant, etc. can be added and kneaded, and, finally it can obtain by applying to a high-pressure homogenizer.

[0018] The food which comes to use the cheese-head Mr. food of this invention All the food using cheese-head Mr. food is included, for example, cheese-head Mr. food is used. A cheese-head flavor filling, A cheese-head flavor topping, a cheese-head flavor spread, the cheese-head flavor source, Food, such as cakes, confectionary, pans, hamburgers, grill processed meat, gratin, kish, pizzas, and rice balls, can also be obtained using the food which could manufacture the cheese-head flavor daily dish etc., and also was obtained by carrying out in this way.

[0019] The food using the cheese-head Mr. food of this invention may contain materials of arbitration other than cheese-head Mr. food usually used for edible. For example, diet materials other than a conjugation trien higher unsaturated fatty acid glyceride may be included. Moreover, a food additive may be added to arbitration.

[0020] Manufacture of the food using the cheese-head Mr. food of this invention can be carried out by the manufacturing method of the food using common cheese-head Mr. food, and the same approach. For example, after putting bacon and an onion on the macaroni scalded beforehand in the case of gratin and covering white sauce and bread crumbs on it, it can obtain by putting cheese-head Mr. food, butter, etc. of this invention, and baking in oven. Moreover, after stir-frying an onion and ground meat in the case of a cheese-head flavor pasta sauce, a tomato, water, a salt, and pepper few \*\* can be added, it can boil thoroughly, the cheese-head Mr. food of this invention can be added after that, and it can obtain by carrying out heating stirring further. In that case, it can carry out by adding the cheese-head Mr. food of this invention at the stage adding cheese-head Mr. food in the manufacturing method procedure of each common food. In that case, the addition of the cheese-head Mr. food of this invention is suitably chosen by the class of food to manufacture, the class of conjugation trien higher unsaturated fatty acid glyceride in the cheese-head Mr. food to be used, and the content.

[0021] From the food using the cheese-head Mr. food of this invention and it containing a conjugation trien higher unsaturated fatty acid glyceride as a fats-and-oils component, it has an adiposity control function, a depot fat reduction promotion function, and a disorders-of-carbohydrate-metabolism improvement function, and prevention and the improvement effect of the lifestyle-related disease accompanying obesity are expected. Moreover, the food using the cheese-head Mr. food of this invention and it is excellent also in flavor, and its mouthfeel is also good. Therefore, it can be used as food which promotes the improvement of a lifestyle-related disease further as lifestyle-related disease prevention food of a lifestyle-related disease reserve group, being able to use food using the cheese-head Mr. food of this invention, and it as the food which carries out maintenance improvement of the health as food which promotes the diet effectiveness by the meal and movement only as diet food, and can be used also as usual food.

[0022]

[Example] (Example 1) Clear pomegranate seed oil, common marigold seed oil, bitter cucumber seedoil, U.S. Japanese catalpa seed oil, balsam APURU seed oil, the Snake guard seed oil, and cherry seed oil were obtained by carrying out centrifugal separation of the fats and oils obtained by pressing oil using the small oil press (1 shaft screw expeller) in the preparation desiccation pomegranate seed, the common marigold seed, the bitter cucumber seed, the U.S. Japanese catalpa seed, the Snake guard seed, balsam Apple Computer seed, or cherry seed of vegetable seed oil for 98066 m/s 2 or 30 minutes. the result of having analyzed the fatty acid composition of each obtained fats and oils -- pomegranate seed oil -- a punicic acid -- 71.6% and common marigold seed oil -- a KARENDEIN acid, 33.4%, in bitter cucumber seedoil, 46.5%, U.S. Japanese catalpa seed oil checked catarrh pinic acid, and the Snake guard seed oil checked that balsam APURU seed oil contained a punicic acid for a punicic acid, and cherry seed oil contained 11.0% for alpha-eleostearic acid 68.0% 48.5% for alpha-eleostearic acid 31.3%. Clay treatment and steam distillation were performed for each clear vegetable seed oil obtained above with the conventional method, and the refined oil of each seed oil was obtained. Flavor and a color are satisfactory as edible oil and fat, and any refined oil of the acid number was 0.5 or less. Manufacture of the following cheese-head Mr. food was presented using the refined oil of each vegetable seed oil obtained above.

[0023] (Example 2) Having fed into the Stephen cooker manufacture cheddar cheese 7kg of a vegetable seed oil content cheese food, 1kg of purification pomegranate seed oil prepared in the example 1, 30g of salt, 200g of sodium polyphosphate, and 1kg of water, and stirring by 1500rpm, open steam was supplied, the temperature up was carried out to 90 degrees C, and the water vapor content supplied so that moisture may finally be set to 1.77kg was adjusted. Subsequently, by putting into a container and cooling to a room temperature, the cheese food containing purification pomegranate seed oil was obtained. Moreover, the cheese food was similarly manufactured about purification vegetable seed oil other than the purification pomegranate seed oil created in the example 1.

[0024] (Example 3) Having fed into the Stephen cooker manufacture cheddar cheese 2kg of a vegetable seed oil content cheese-head processed food, 1kg of purification pomegranate seed oil prepared in the example 1, 30g of salt, 200g of sodium polyphosphate, and 1kg of water, and stirring by 1500rpm, open steam was supplied, the temperature up was carried out to 90 degrees C, and the water vapor content supplied so that moisture may finally be set to 1.77kg was adjusted. Subsequently, by putting into a container and cooling to a room temperature, the cheese-head processed food containing purification pomegranate seed oil was obtained. Moreover, the cheese-head processed food was similarly manufactured about purification vegetable seed oil other than the pomegranate seed oil created in the example 1. The cheese-head processed food containing each obtained vegetable seed oil was practically equal as compared with the cheese-head processed food usual in flavor and mouthfeel.

[0025] (Example 4) 200g of water, 3g of phosphoric-acid disodium, and 8g of salt were added, and at 60 degrees C, heating stirring was carried out and it dissolved in the manufacture iron pot of a pomegranate seed oil content imitation cheese head. Subsequently, after added rennet casein 20g, 20g [ of skim milk powder, 5g / of amylum oryzae, and corn-starch 5g, gum arabic 5g, and carrageenan 5g, carried out heating stirring at 95 degrees C, having added 3g of lactic acids, and 200g of water, having carried out heating stirring at 80 degrees C, adding further 570g of purification pomegranate seed oil prepared in the example 1 and carrying out heating stirring at 70 degrees C, cheese-head flavor 20ml, 2ml of beta carotene, and 30mg of alpha-tocopherol be added and kneaded Then, the obtained kneading object was covered over the homogenizer by the pressure of 25MPa(s), and the good imitation cream cheese of flavor and mouthfeel was obtained.

[0026] (Example 5) It burned until the color was attached in 200-degree C oven, and a little butter which tore the cheese food of the pomegranate seed oil content manufactured in bread-crumbs few \*\* and the example 2 three cups of tablespoons was put on it, the piece end of parsley was put [ butter was spread on the manufacture gratin dish of gratin, the macaroni optimum dose scalded beforehand, the stir-fried bacon, and an onion were added, white sauce was poured, ], and the cheese-head flavor gratin which does not have a problem in flavor and mouthfeel was obtained.

[0027] (Example 6) the manufacture pan of a cheese-head flavor pasta sauce -- two cups of salad oil tablespoons -- putting in -- warming -- the onion made the piece end the back -- a large -- one piece was added, it stir-fried until it became light brown, 750g of ground meat was added, and it stir-fried until it became brown. Subsequently, tomato (canning) 400g was added and it crushed well in the pan, it heated until it added and boiled one cup of basil teaspoon, four cups of tomato puree tablespoons, 1l. of water, and a salt and

pepper few \*\*, and 1 hour and a half were boiled until moisture evaporated, and it added 500g of pomegranate seed oil content imitation cheese heads further manufactured in the example 4, heating stirring was carried out [ it was made the low heat after ebullition, and ], and the pasta sauce of cheese-head flavor was obtained.

[0028] (Example 7) 4 pieces of manufacture shrimps of a cheese-head flavor cream croquette were washed with salt water, and moisture was wiped off, the pan was covered with the thin slice of an onion half individual upwards, and it carried, and four cups of alcohol tablespoons, and a salt and pepper few \*\* were \*\*ed, it covered, cooking was carried out for 10 minutes with low heat, the shell was taken, and it unfolded finely. Subsequently, two cups of pomegranate seed oil content cheese-head processed food cups obtained in the white sauce and example 3 of two cups of cups were taken in the pan, after adding and warming the above-mentioned shrimp and cooling it after melting, it collected into the form, batter liquid and bread crumbs were attached, it fried in the oil for deep-frying heated at 180 degrees C, and flavor and the good cream croquette of the cheese-head style of mouthfeel were obtained.

[0029] (Example 8) It is easy to add butter 70g melted by the water bath, it is mixed with biscuit 100g in which the cheesecake carried out manufacture grinding, and it puts into a mold, and covering with and pushing a wrap film, it lengthens to homogeneity and a biscuit base is built. 2.5 cups of water teaspoons are added to 2.5 cups of gelatin teaspoons, and it is left for 15 minutes, and it applies to a water bath, melts and cools. It scours in the shape of a cream with a whipper, and 40g [ of sugar ], 120ml [ of whipped cream ], and yogurt 100ml, and two cups of lemon-juice tablespoons, mixing in order of the gelatin prepared above beforehand, in addition, pomegranate seed oil content cheese food 200g manufactured in the example 2 is often mixed, and is smoothed. It passed on the above-mentioned biscuit base, and the refrigerator was cooling for 3 hours, it hardened, and the cheese-head flavor yogurt cake was created.

[0030] (Example 9) The good cheeseburger of flavor was obtained by burning the crown of the manufacture bans of a cheeseburger by the toaster, shaking one shot for mustard, shaking mincing of one shot and an onion for catsup one, putting on crown the meat which burned one pickle, and putting the heel part which put the common marigold seed oil content cheese food manufactured in the example 2 on it, and was toasted.

[0031] (Example 10) the manufacture marketing pizza of cheese-head flavor pizza -- the thin slice of one medium size tomato, the slice of the Beeman half individual, and one julienned slice hum were put on the one ground, on it, the topping of the pomegranate seed oil content cheese-head flavor gratin 20g manufactured in the example 5 was carried out, cheese-head 20g for commercial pizzas was carried further, it burned at 200 degrees C using the microwave oven, and the pizza which does not have a problem in flavor and an opening point was obtained.

[0032] (Example 11) The feminity ICR system CD-1 mouse (product made from char RUZURIBA, Inc.) of the 6 weeks old adiposity depressor effect of a pomegranate seed oil content cheese food was divided into eight animal / group, and it bred for four weeks using the feed which added and prepared pomegranate seed oil content cheese food 20% manufactured in the example 2 to the standard mixed feed for mouse rats (AIN- for growth periods 93 G, Oriental Yeast Co., Ltd. make) from which the fat was removed (pomegranate cheese food group). It dissected under anesthesia after four weeks, perimeter [ kidney ] fat tissue and perimeter [ ovary ] fat tissue were extracted, and

weight was measured. The sum of both the obtained fat tissue weight was \*\* (ed) in weight, and it asked for the bigeminum pile fat tissue weight ratio. The feed which added 20% and prepared the cheese food which used soybean oil instead of pomegranate seed oil, and was prepared by the approach of an example 2 as a control group 1 was used. The result was shown in Table 1 as phase contrast at the time of setting the bigeminum pile fat tissue weight ratio of a control group 1 to 100. Consequently, by the group which took in the pomegranate seed oil content cheese food, are recording of visceral fat was notably controlled from the group which took in the cheese food which used soybean oil.

[0033]

[Table 1]

**表 1 ザクロ種子油含有チーズフードの脂肪蓄積抑制効果**

群	脂肪組織重量相対比 (平均 n = 8)
対照群 1	100 ± 10
ザクロチーズフード群	84 ± 8

[0034] The feed which similarly added and prepared 20% of bitter-cucumber-seedoil content cheese-head processed foods manufactured in the example 3, The result examined using the feed which added and prepared 20% of soybean-oil content cheese-head processed foods which used soybean oil instead of bitter cucumber seedoil, and were manufactured by the approach of an example 3, By the group which took in the feed which added the bitter cucumber seed content cheese-head processed food, it was the inclination for are recording of visceral fat to be controlled from the group which took in the feed which added the soybean-oil content cheese-head processed food. Moreover, the feed which added and prepared pomegranate seed oil content imitation cheese-head 20% manufactured in the example 4, The result examined using the feed which added and prepared soybean-oil content imitation cheese-head 20% which used soybean oil instead of pomegranate seed oil, and was manufactured by the approach of an example 4, By the group which took in the feed which added the pomegranate seed content imitation cheese head, it was the inclination for are recording of visceral fat to be controlled from the group which took in the feed which added the soybean-oil content imitation cheese head.

[0035] (Example 12) Feminity C57BL/6J mouse (product made from char RUZURIBA, Inc.) of the 10 weeks old visceral fat reduction effectiveness of a pomegranate seed oil content cheese food After making it obesity by breeding for four weeks with the high fat and quantity sugar partial eclipse purified diet (Oriental Yeast Co., Ltd. make) which shows a presentation in Table 2, it divided into eight animal / group, one group was dissected, \*\*\*\*\* fat tissue and perimeter [ ovary ] fat tissue were extracted, and weight was measured (control group 2). Other groups as a trial group The group which gave 2% of soybean oil, and the feed which added pomegranate seed oil content cheese food 18% manufactured in the example 2 to the standard mixed feed for growth periods (AIN-93G: Oriental Yeast Co., Ltd. make) from which fat was removed as a source of essential fatty acid, and was bred for further four weeks (pomegranate cheese food group), It is the group (soybean cheese food group) bred for further four weeks with the feed which added soybean-oil content cheese food 18% manufactured by the same approach as an example 2 using 2% of soybean oil, and soybean oil. It dissected under anesthesia after four weeks,

perimeter [ kidney ] fat tissue and perimeter [ ovary ] fat tissue were extracted, and weight was measured. The sum of both the obtained fat tissue weight was \*(ed) in weight, and it asked for the bigeminum pile fat tissue weight ratio. The result was shown in Table 3 as phase contrast at the time of setting the bigeminum pile fat tissue weight ratio of a control group 2 to 100. Consequently, by the group which took in the pomegranate seed oil content cheese food, the visceral fat reduction facilitatory effect more remarkable than the group which took in the soybean-oil content cheese food was accepted.

[0036]

[Table 2]

表2 高脂肪・高糖分食飼料組成

成分	組成 (%)	成分	組成 (%)
カゼイン	25.00	AIN-93ミネラル混合	3.50
コーンスターチ	14.86	AIN-93ビタミン混合	1.00
シュクロース	20.00	重酒石酸コリン	0.25
大豆油	15.00	第三ブチルヒドロキノン	0.006
ラード	15.00	L-シスチン	0.38
セルロースパウダー	5.00		
エネルギー比率：脂肪（53％）、炭水化物（27％）、蛋白質（20％）			
総エネルギー：21338 kJ/kg			

[0037]

[Table 3]

表3 ザクロ種子油含有チーズフードの内臓脂肪低減効果

群	脂肪組織重量相対比（平均 n=8）
対照群2	100±11
ザクロチーズフード群	85±9
大豆チーズフード群	95±10

[0038] The feed which similarly added and prepared 18% of bitter-cucumber-seedoil content cheese-head processed foods and 2% of soybean oil manufactured in the example 3, The result examined using the feed which added and prepared 18% of soybean-oil content cheese-head processed foods and 2% of soybean oil which used soybean oil instead of and was manufactured by the approach of an example 3, [ bitter cucumber seedoil ] By the group which took in the feed which added the bitter-cucumber-seedoil content cheese-head processed food, the visceral fat reduction facilitatory effect more remarkable than the group which took in the feed which added the soybean-oil content cheese-head processed food was accepted.

[0039] (Example 13) The femininity \*\*\*\*\* onset KK-Ay mouse (average weight of 27.5g) (it receives from Japanese Clare, Inc.) of the 5 weeks old disorders-of-carbohydrate-metabolism improvement effect of a pomegranate seed oil content cheese-head processed food After one-week preliminary breeding, AIN-93G feed (Oriental Yeast Co., Ltd. make) (casein 20.0% --) from which it divided into five animal / group, and one group (control group) removed fat Corn-starch 49.948% and shoe cloth 10.0% and cellulose powder 5.0%, 3.5% of AIN-93 mineral mixing, 1.0% of AIN-93 vitamin mixing, Heavy tartaric-acid choline 0.25% and tertiary butyl hydroquinone 0.002%, With alteration AIN-93G feed (energy ratio; 22% of fats, 58.5% of carbohydrates, 19.5% of protein, gross energy 17154 kJ/kg) which added 10% of soybean oil to L-cystine 0.30% Moreover, one group (TOROGURIDAZON group) is feed which added insulin resistance improvement medicine TOROGURIDAZON 0.2% in alteration AIN-93G feed. Moreover, one another group (pomegranate seed oil content cheese-head processing food group) It is feed replaced with the pomegranate seed oil content cheese-head processed food which prepared a minute in the example 3 8% of the soybean oil of alteration AIN-93G feed. Furthermore, one another group (soybean-oil content cheese-head processing food group) 8% minute of the soybean oil of alteration AIN-93G feed was bred for soybean oil for further four weeks under the free food intake condition instead of pomegranate seed oil with the feed replaced with the cheese-head processed food used and prepared like the example 3, respectively. Feed was exchanged for the thing fresh to two days or day by day [ 3 ], and recorded food consumption. Moreover, it collected blood from the caudal vein weekly, and the blood sugar level was measured using the simple type blood sugar measuring instrument (NOBOA cyst plus: NOBONORUDEIKUSU FARM incorporated company make) at the time of gluttony. In addition, the amounts of baiting of each group of a trial term throughout are an average of 5.3 g/day per individual, and did not accept a significant difference by between groups [ each ]. Moreover, each difference significant between groups was not accepted in weight, either. Consequently, in the control group and the soybean-oil content cheese-head processing food group, after one week of test initiation, the blood sugar level exceeded 400 mg/dl, and showed the symptoms of diabetes mellitus, and the condition maintained it till four weeks. On the other hand, through the duration of test, it was maintained by 200 or less mg/dl of blood sugar levels, and stopped at the TOROGURIDAZON group and the pomegranate seed oil content cheese-head processing food group mostly at normal values.

[0040]

[Effect of the Invention] Although cheese-head Mr. food was food far from diet food conventionally since it was a high calorie, from containing the conjugation higher unsaturated fatty acid glyceride which has conjugation trien structure as a fats-and-oils component, the food using the cheese-head Mr. food of this invention and it has adiposity depressor effect, a depot fat reduction facilitatory effect, and a disorders-of-carbohydrate-metabolism improvement effect, and can expect prevention and the improvement effect of the lifestyle-related disease accompanying obesity. Moreover, the cheese-head Mr. food of this invention is excellent in flavor, and since mouthfeel is also good, it can use the cheese-head Mr. food of this invention for various food. Therefore, it can be used as food which promotes the improvement of a lifestyle-related disease further as lifestyle-related disease prevention food of a lifestyle-related disease reserve group, being able to



use food using the cheese-head Mr. food of this invention, and it as the food which carries out maintenance improvement of the health as food which promotes the diet effectiveness by the meal and movement only as diet food, and can be used also as usual food.

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## CORRECTION OR AMENDMENT

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[Kind of official gazette] Correction of a open patent official report

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